Clear Creek Technical Team Annual OCAP BO Review

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U.S. Fish and Wildlife Service
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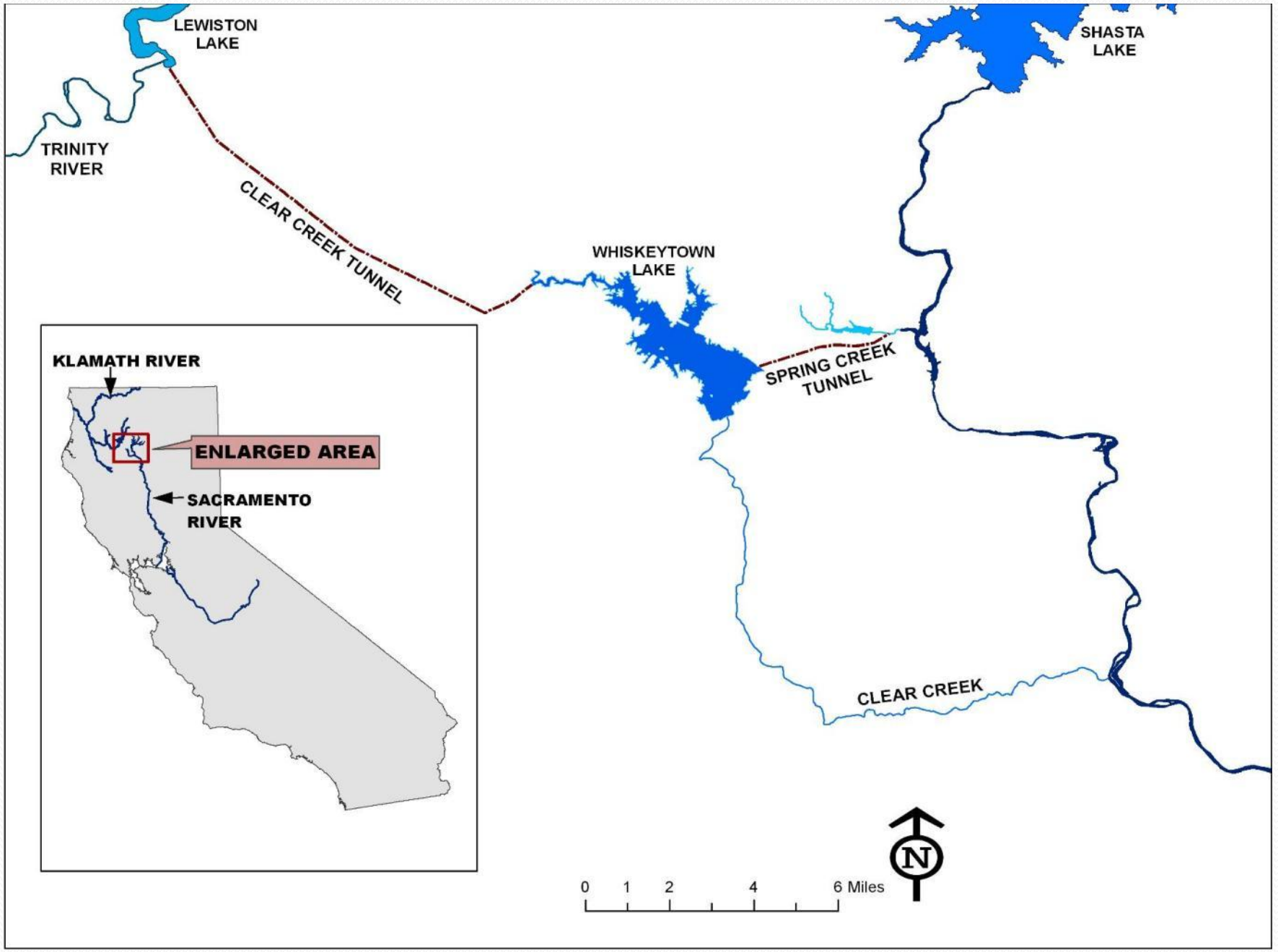
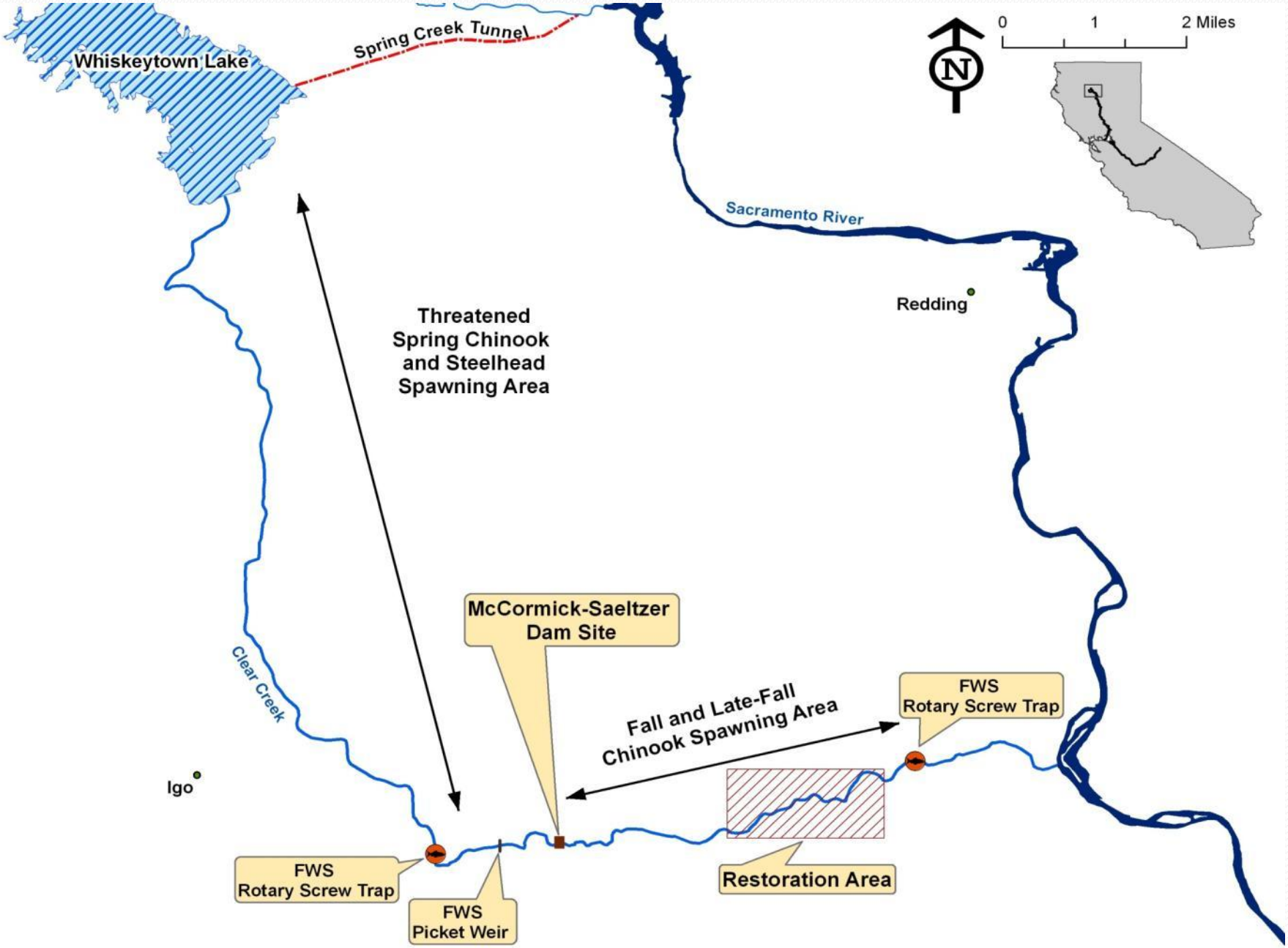
Presentation Overview

- RPA Scorecard
- Clear Creek Background
- RPA Actions I.1.1 through I.1.6

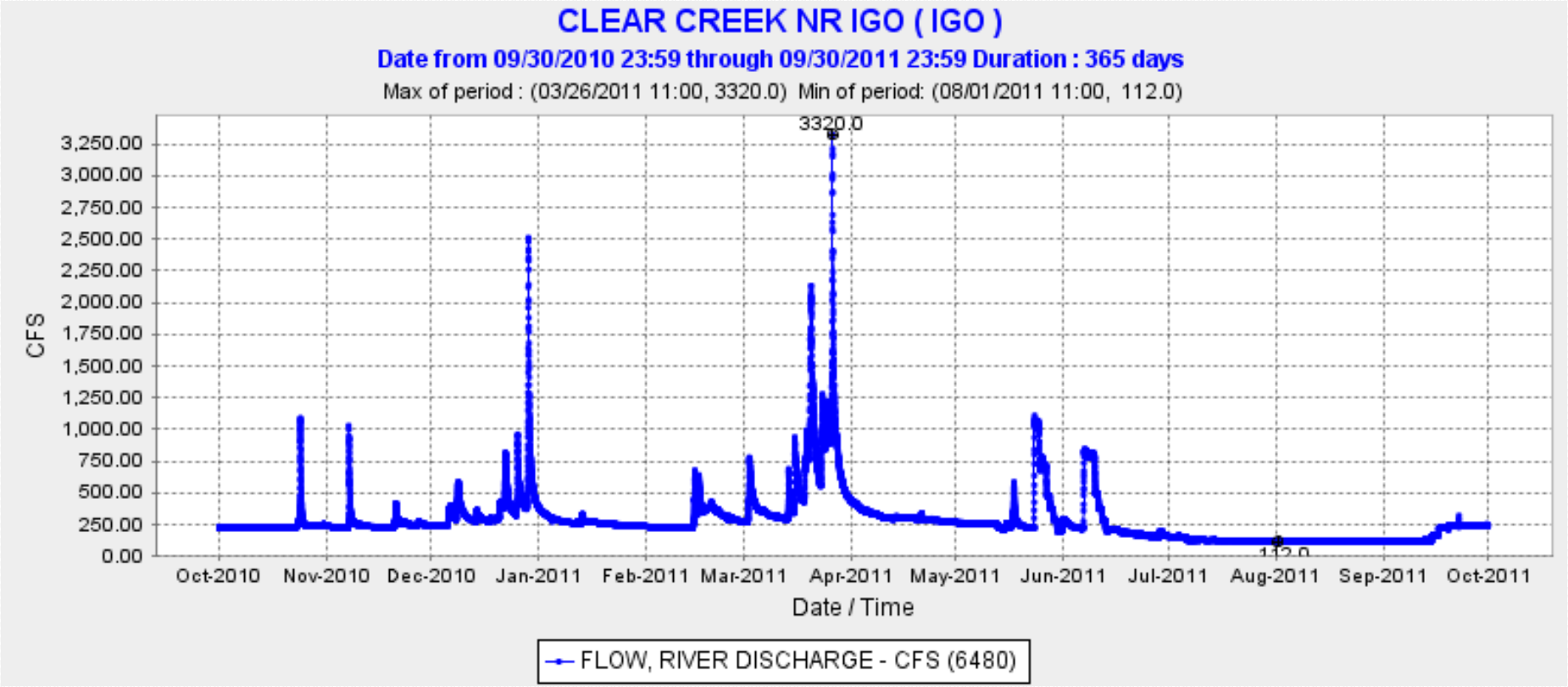
Progress Towards RPA Actions:

- Spring Attraction Flows — Yes
- Channel Maintenance Flows — Yes
- Spawning Gravel Addition — Yes
- Replace Temperature Curtain — Yes
- Thermal Stress Reduction — Yes / No
- Adaptively Manage to Habitat Suitability / IFIM Study Results — Yes

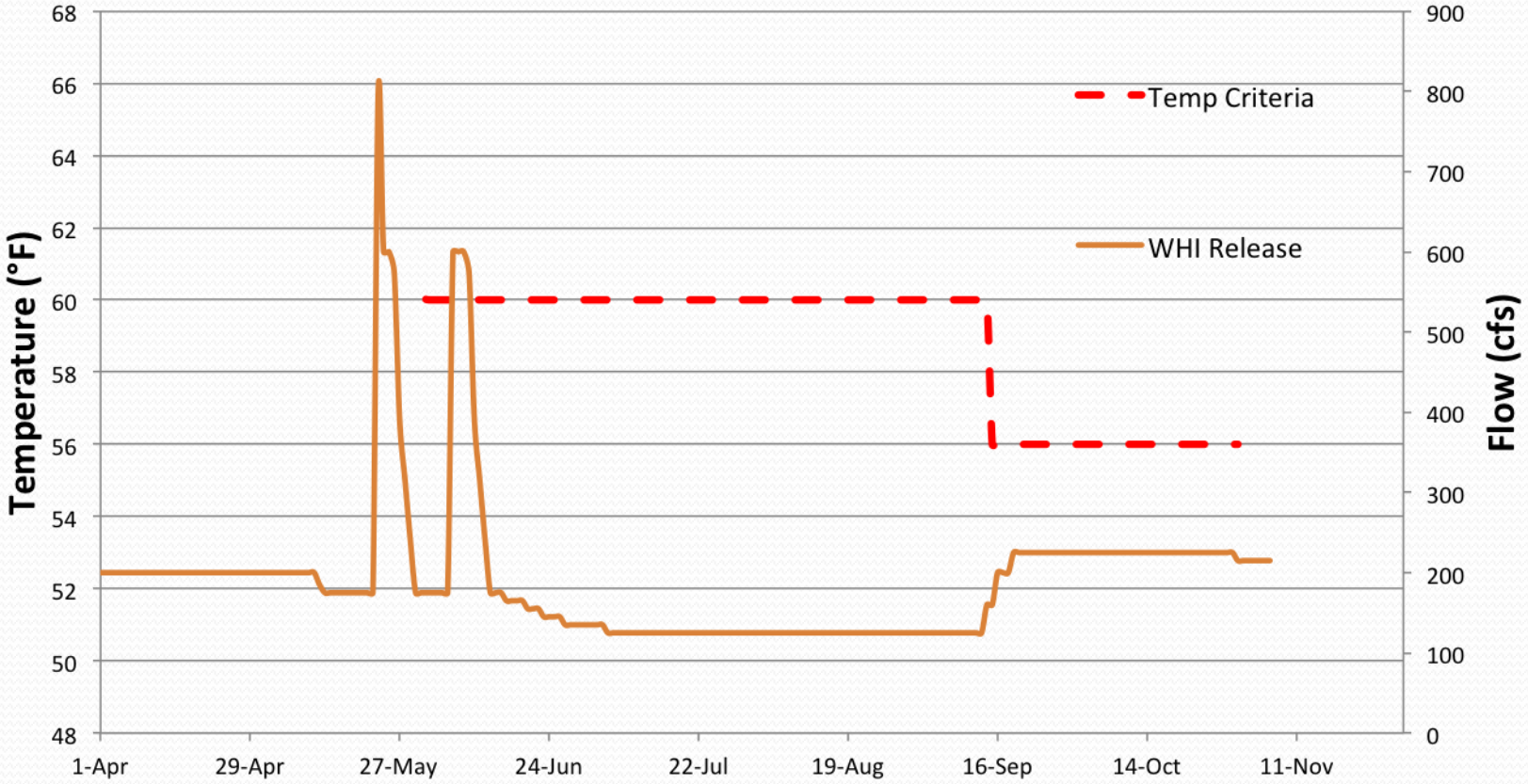

LEWISTON LAKE
TRINITY RIVER
CLEAR CREEK TUNNEL
WHISKEYTOWN LAKE
SHASTA LAKE
SPRING CREEK TUNNEL
CLEAR CREEK
KLAMATH RIVER
ENLARGED AREA
SACRAMENTO RIVER
0 1 2 4 6 Miles
N


Whiskeytown Lake
Spring Creek Tunnel
Sacramento River
Redding
Threatened
Spring Chinook
and Steelhead
Spawning Area
McCormick-Saeltzer
Dam Site
Clear Creek
Igo
Fall and Late-Fall
Chinook Spawning Area
FWS
Rotary Screw Trap
FWS
Rotary Screw Trap
FWS
Picket Weir
Restoration Area
N
0
1
2 Miles

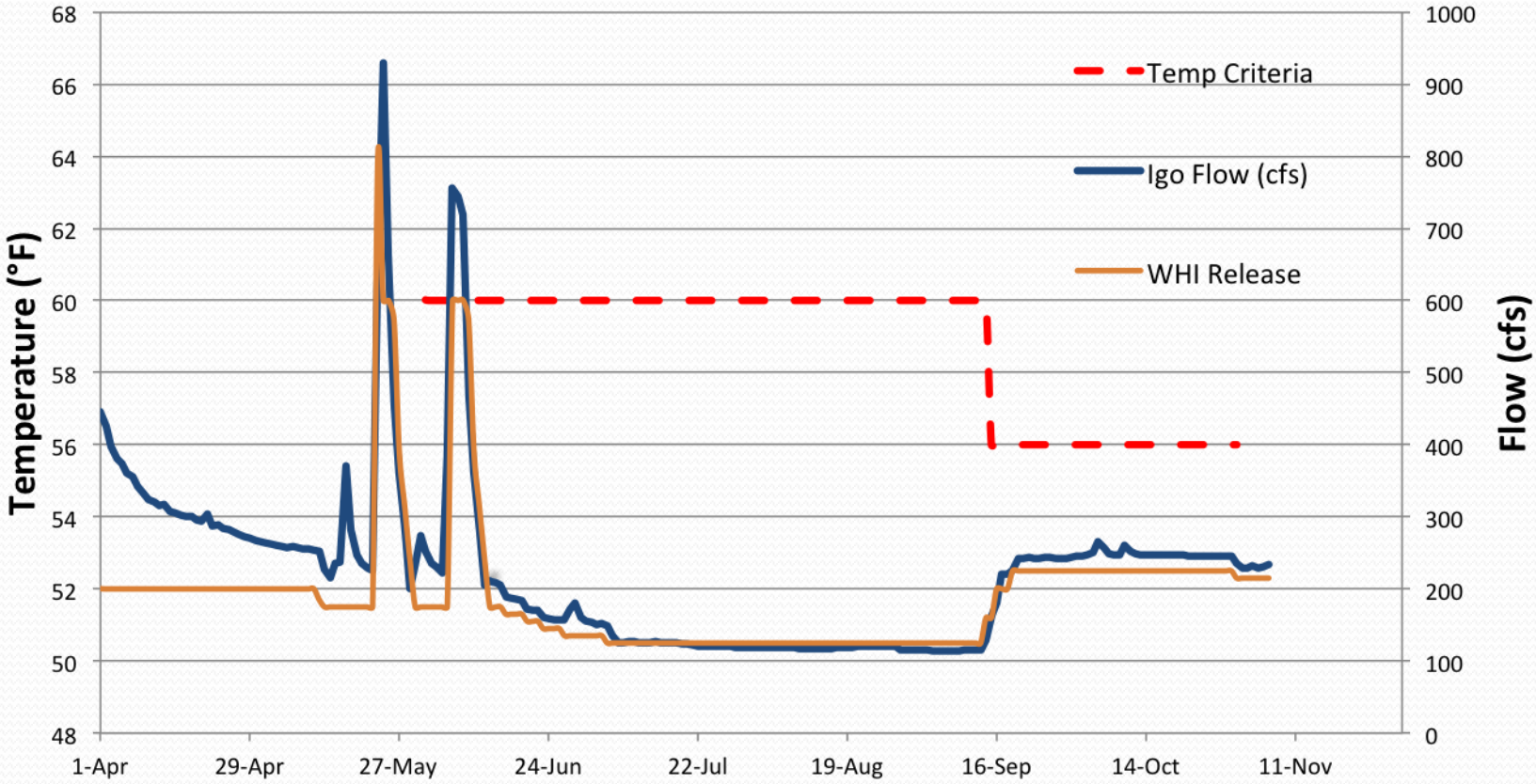
WY 2011 Flow at Igo Gage



2011 Whiskeytown Release



2011 Whiskeytown Release and Igo Flow



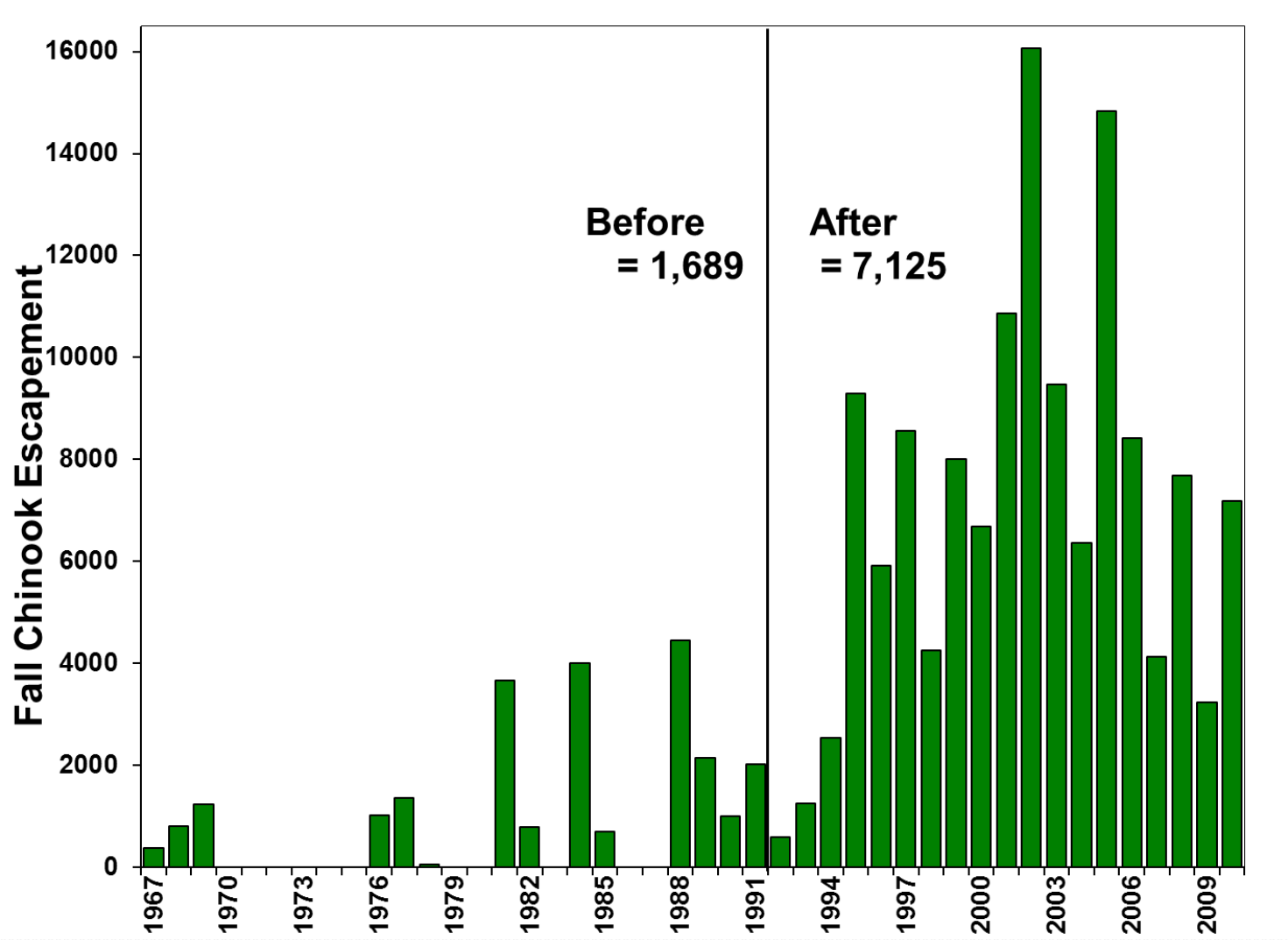
Spring Attraction Flows

- **Objective:** Encourage spring-run movement upstream for spawning.
- **Action:** Annually conduct two pulse flows in May and June of at least 600 cfs for at least three days for each pulse.
- **Results:** Two pulse flows were provided between May 23 and June 13, 2011.
- **Results:** Verified that higher flows could be obtained
- **Results:** Fish distribution inconclusive

Channel Maintenance Flows

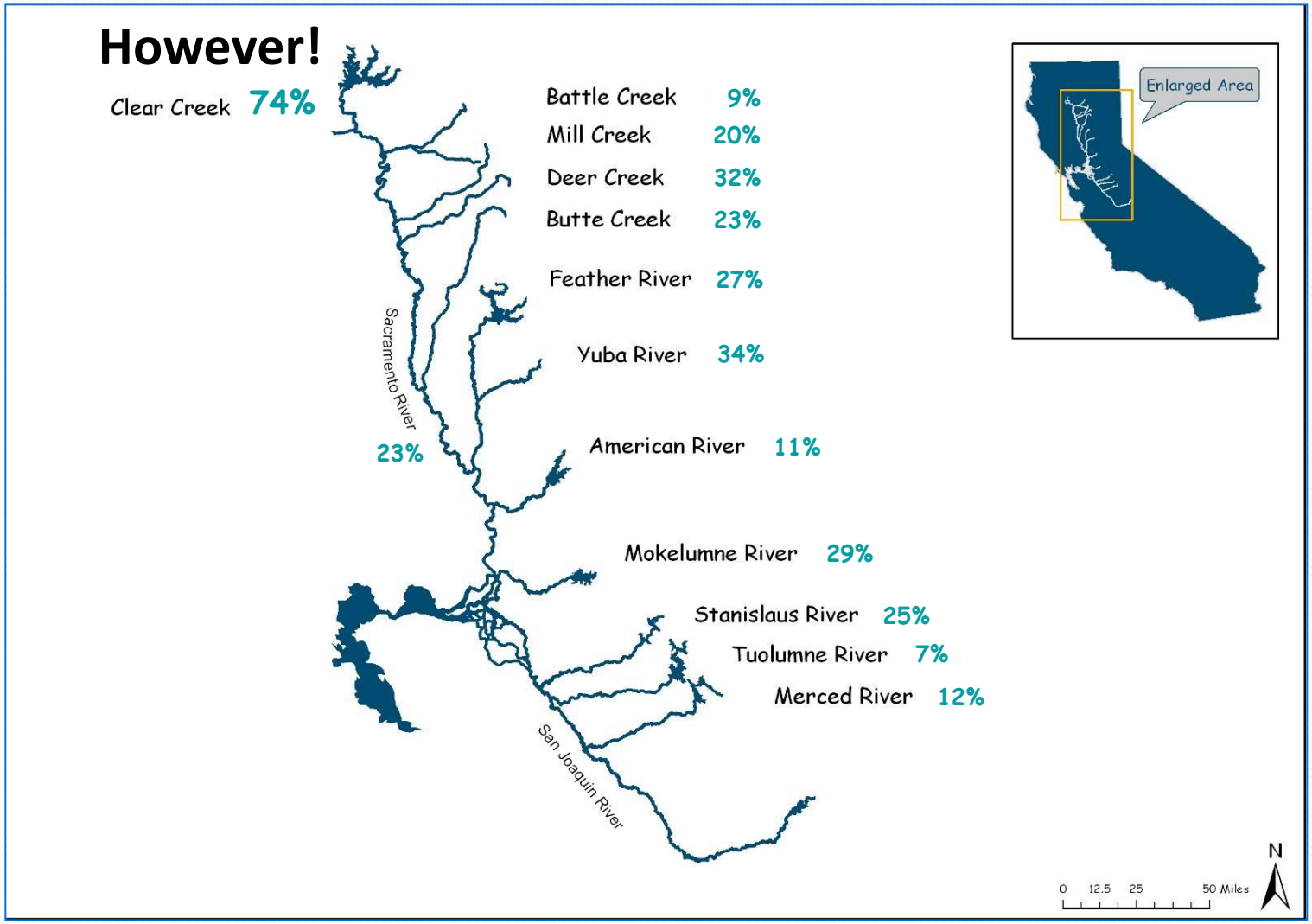
- **Action:** Re-operate Whiskeytown during the winter and spring to produce channel maintenance flows.
- **Results:** Re-operation has not occurred yet.
- **Results:** In 2008, CALFED ERP contracted FWS to plan and implement a one-time re-operation.
- **Results:** In October 2011, an initial 3-day review and orientation workshop was held in Sacramento.
- **Results:** Fine sediment increasing, juvenile productivity decreasing

Four-Fold Increase in Fall Chinook



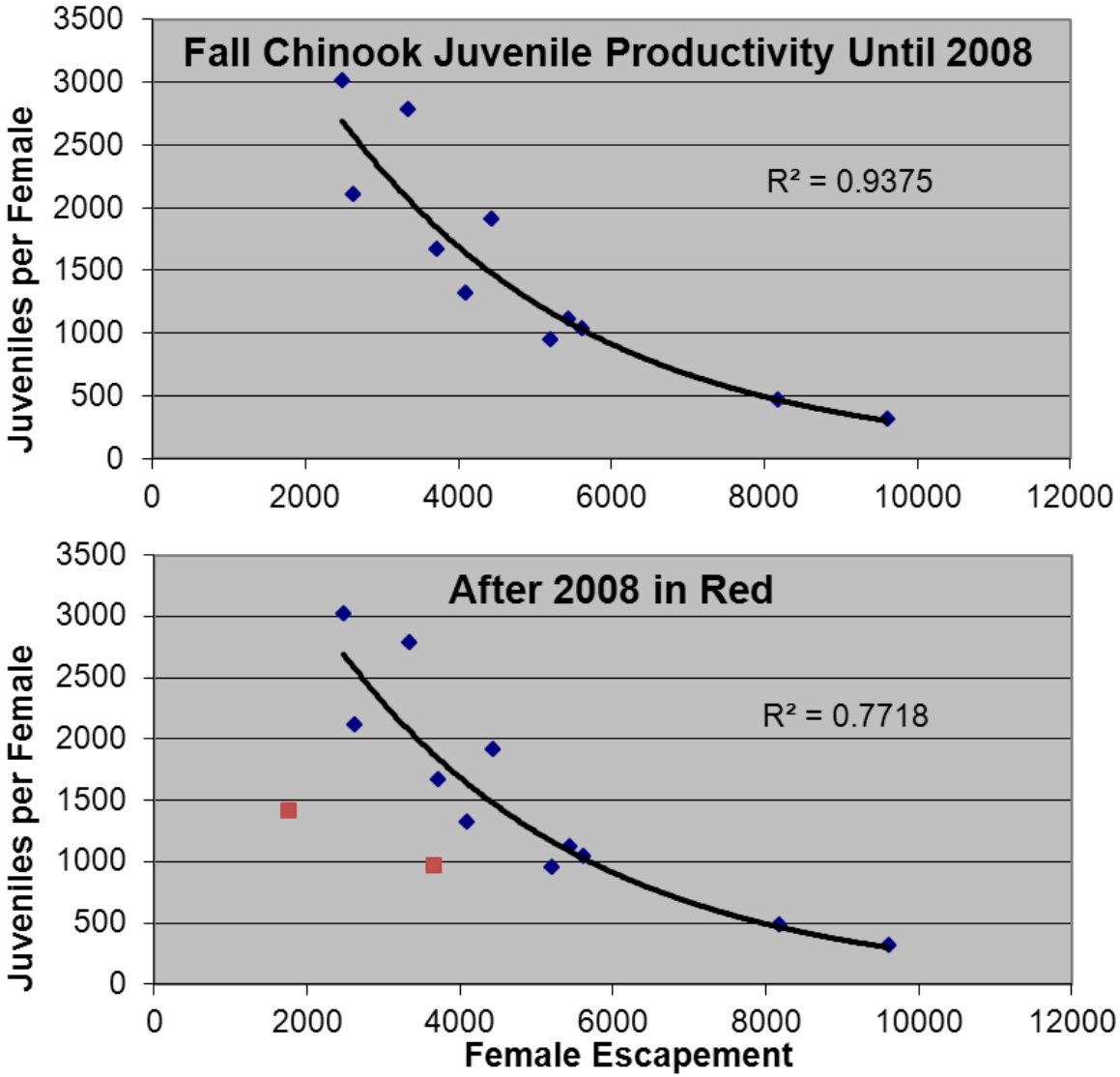
Data from DFG Red Bluff Carcass Survey

In 2007 to 2010, Central Valley Fall Chinook Collapsed to 24% of 1992-2006 Average

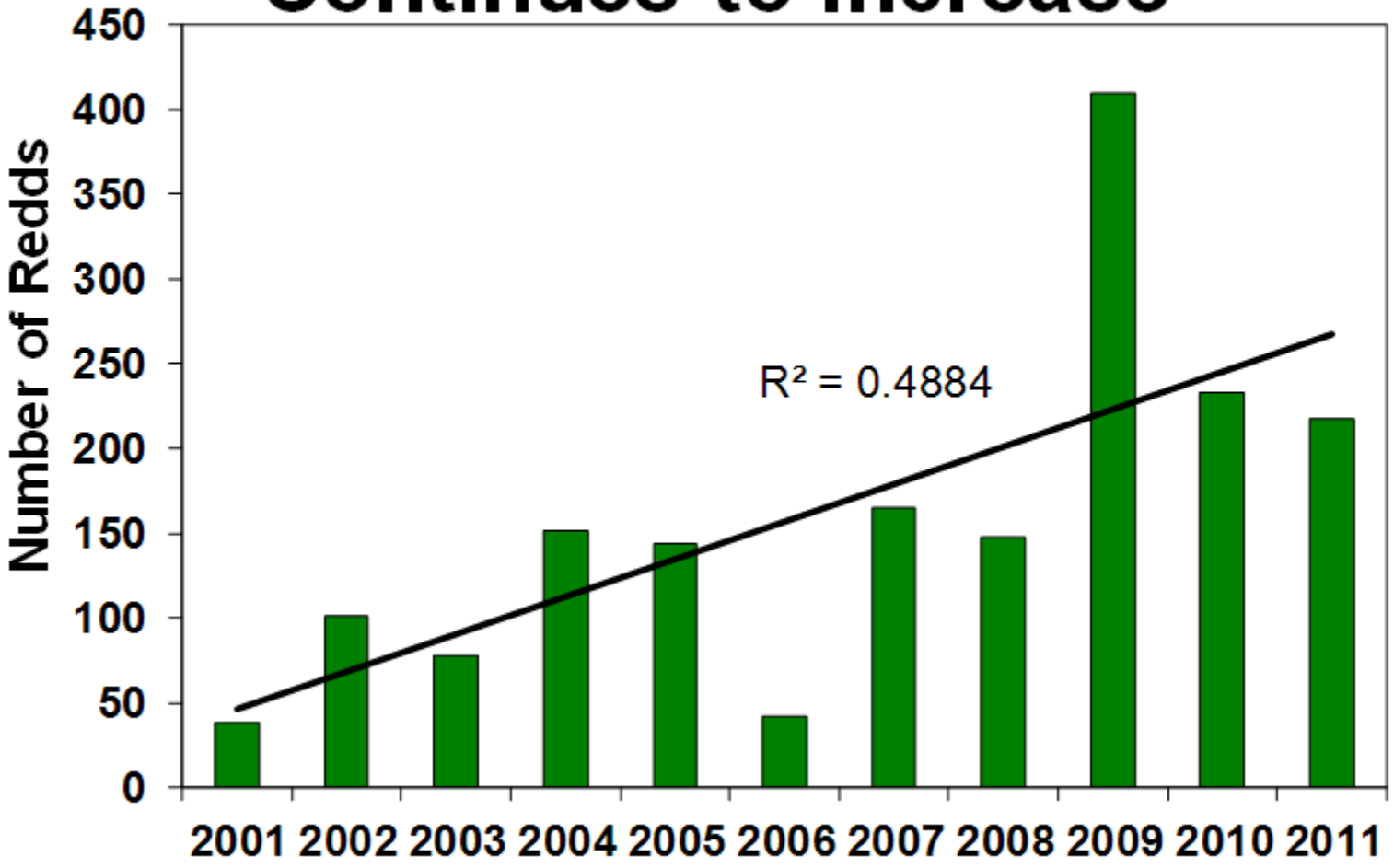



2008 Moon Fire in Clear Creek
CAT
CAT
322B

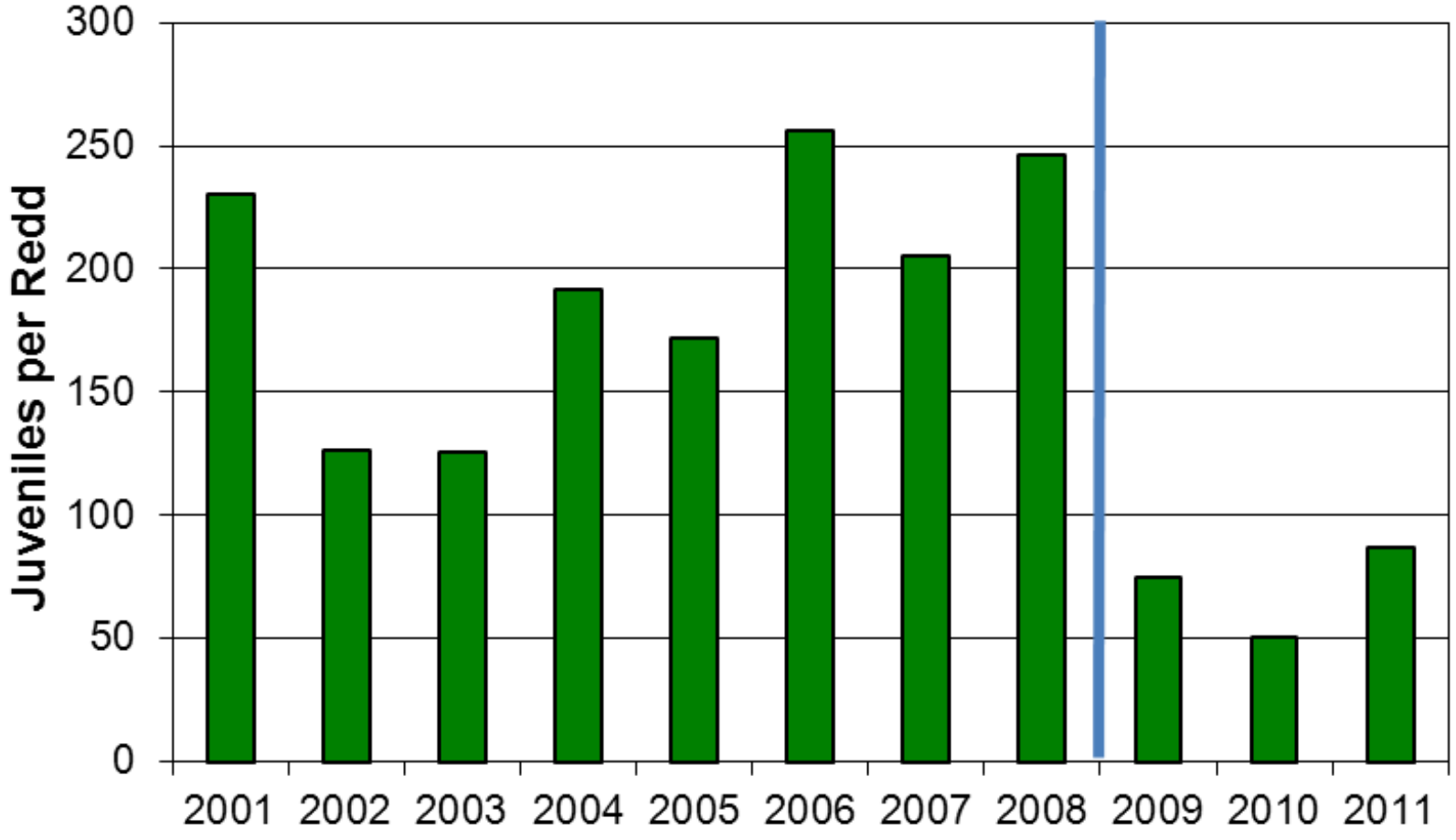
Juvenile Productivity Declining?



Steelhead Population Continues to Increase



Steelhead Juvenile Productivity Decreased 86% After 2008 Fires



Channel Maintenance Flows

- **Recommendation:** Reclamation and other agencies should continue discussions for possible implementation.

Spawning Gravel Additions

- Actions: Continue spawning gravel augmentation and provide report to NMFS on Implementation and Effectiveness.
- Results:
  - 5 Projects totaling 10,000 tons
  - Long-term permits
  - Long-term gravel supply
  - Report summarized fisheries monitoring related to effectiveness.

Replace Temperature Curtain

- **Objective:** Reduce water temperatures for listed salmonids in the Sacramento River.
- **Action:** Replaced the Spring Creek Temperature Control Curtain in Whiskeytown Lake by 2011.
- **Results:** New curtain installation completed by June 15, 2011.
- **Recommendation:** Evaluate the effectiveness of the temperature control curtain in reducing water temperatures in both the Sacramento River and Clear Creek.

Thermal Stress Reduction

Yes / No

- **Objective:** Reduce thermal stress to over-summering steelhead and spring-run
- **Action:** manage releases to meet mean daily water temperatures at Igo gage
- **Action:** Assess improvements to modeling water temperatures and identify a schedule for making improvements.

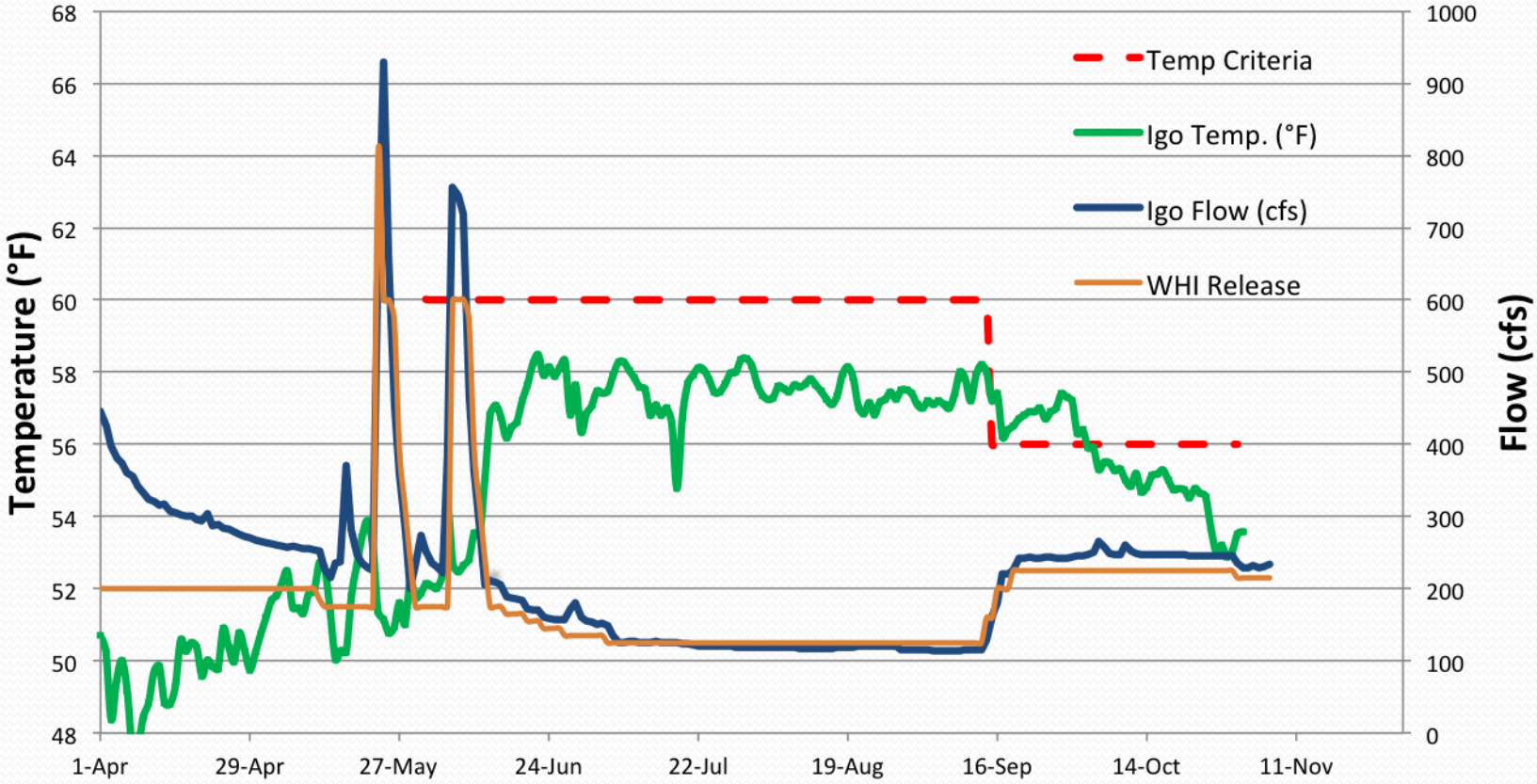
What Modeling or Analysis Could be Used to Improve Water Temperatures in Clear Creek?

While balancing cold-water pools and temperatures in the Trinity and Sacramento Rivers?

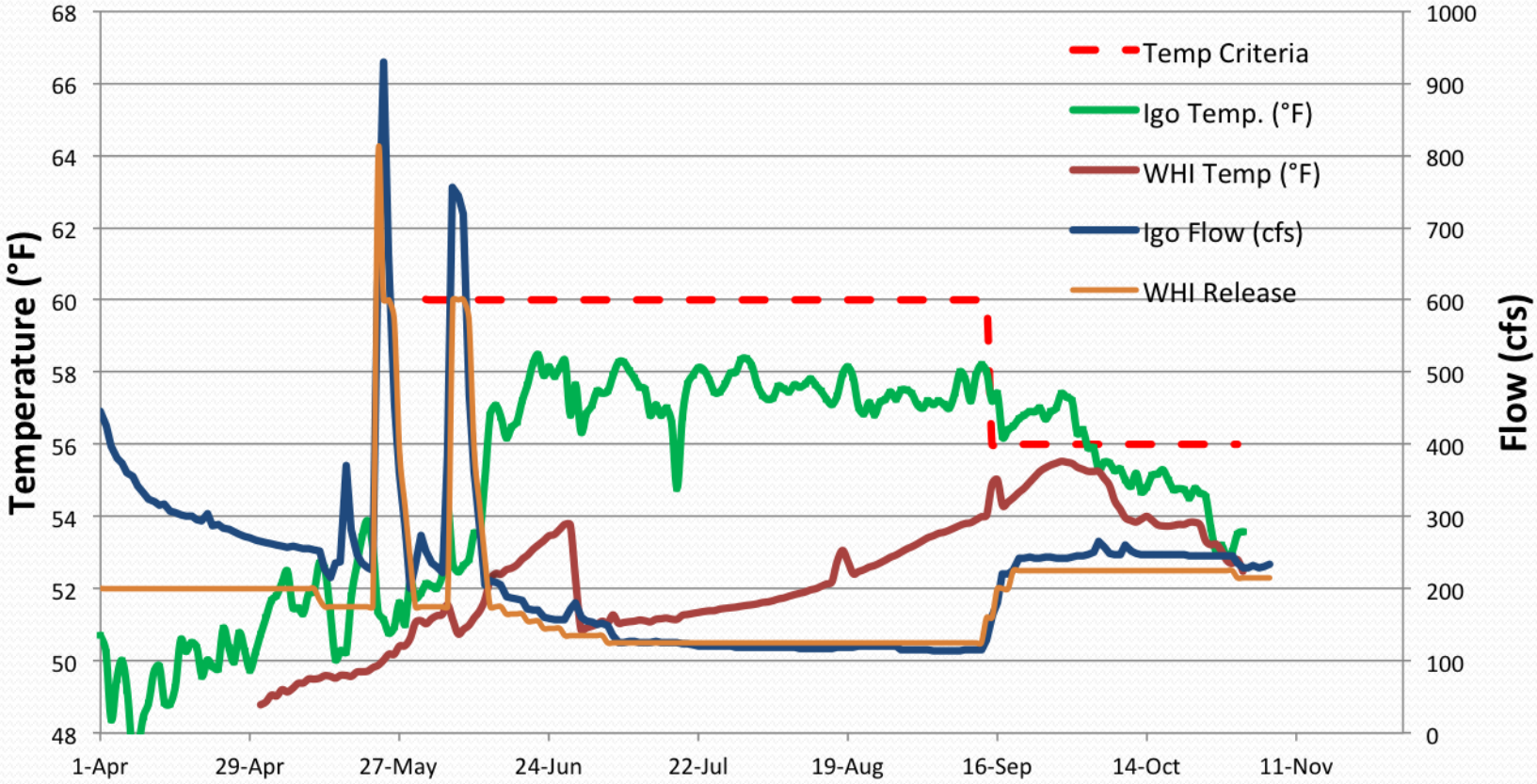
Temperature Targets:

	From	To	Target	Average 2001 to 2008	2009	2010	2011
Holding	01-Jun	14-Sep	60° F	99%	100%	100%	100%
Spawning	15-Sep	31-Oct	56° F	93%	**28%**	**26%**	**62%**

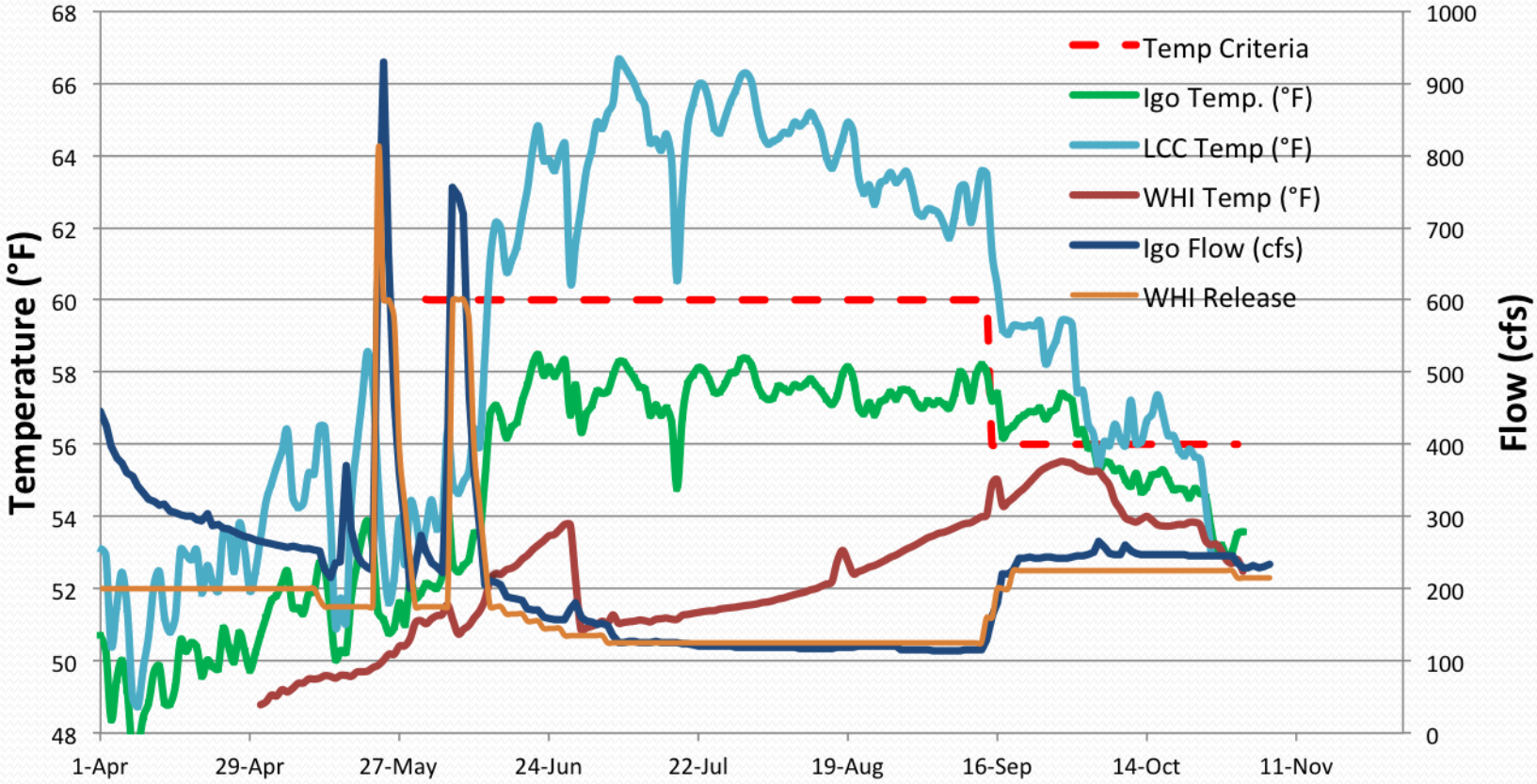
2011 Clear Creek Igo Flow and Temperatures



2011 Clear Creek Igo Flow and Temperatures



2011 Clear Creek Igo Flow and Temperatures



What Modeling or Analysis Could be Used to Improve Water Temperatures in Clear Creek?

While balancing cold-water pools and temperatures in the Trinity and Sacramento Rivers?

What Could Modeling Include?

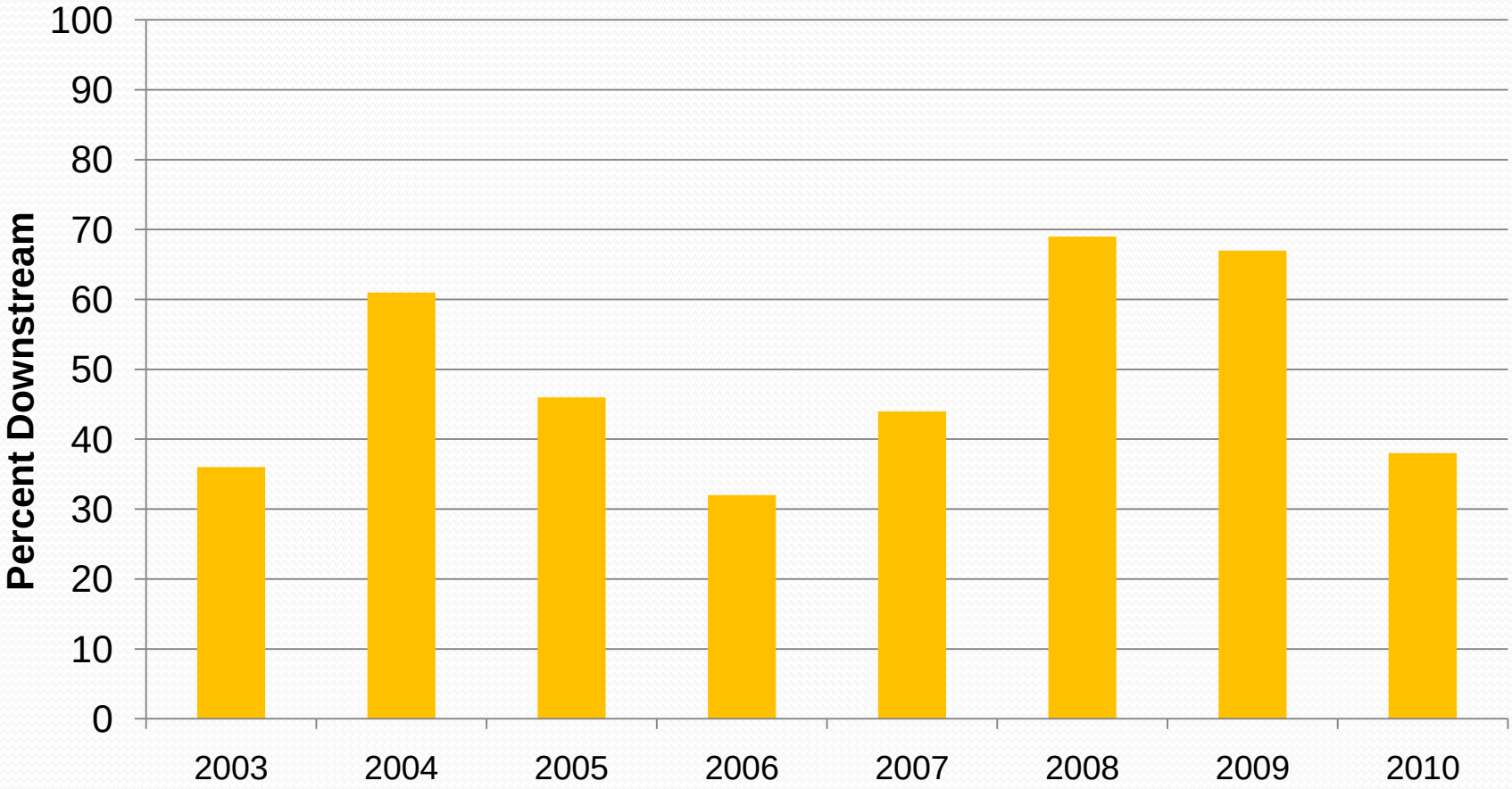
- Compare affects of different operations on cold water pool in Whiskeytown and other two reservoirs.
- Tradeoffs with Trinity and Sacramento River
- Change pattern and volume of delivery
- Investigate ways the Whiskeytown cold water pool could be increased and/or prolonged into the summer.
- How would using less water during the summer effect the duration of the coldwater pool?
- What causes accelerated warming in September?

Recommendations:

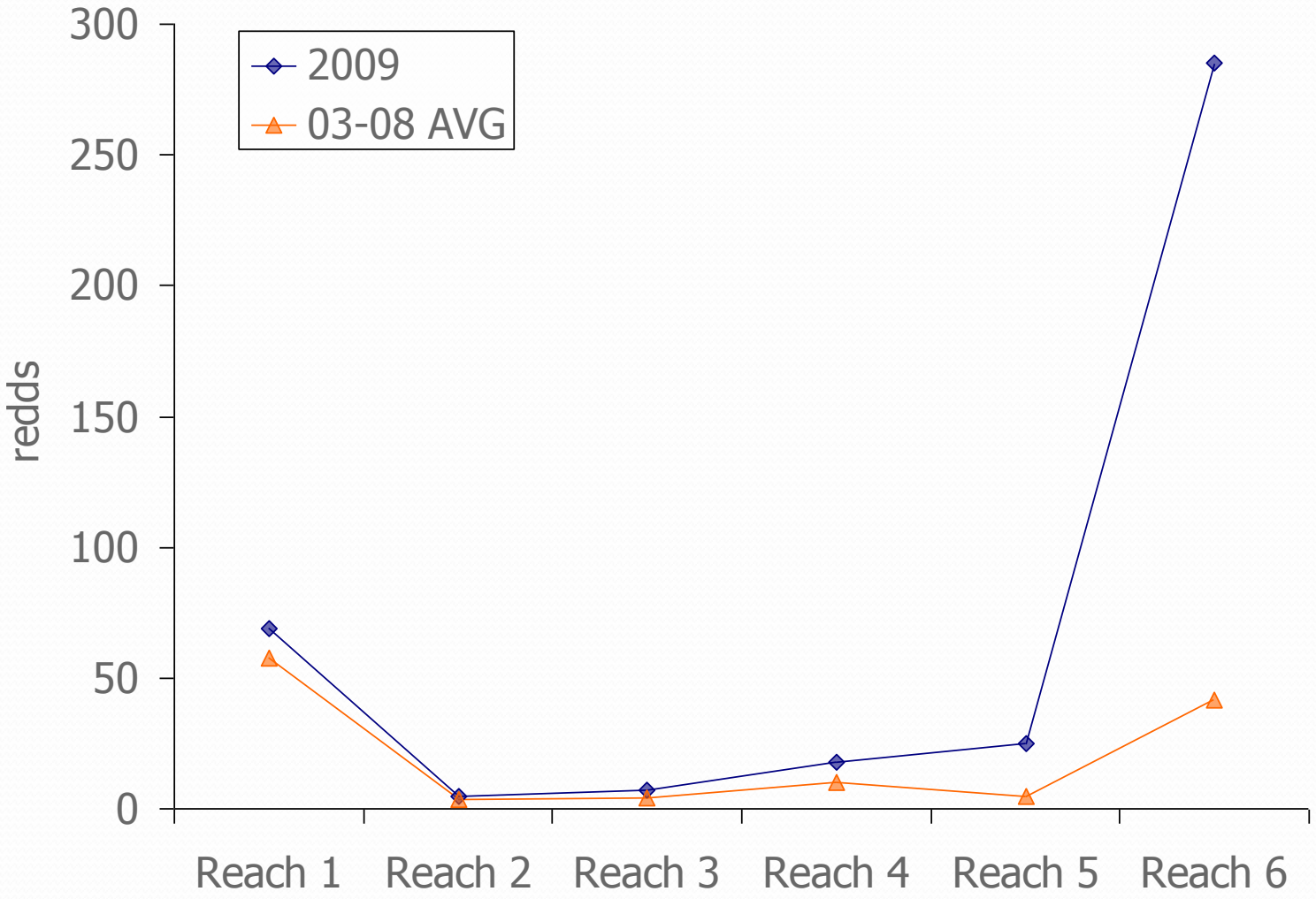
- Develop a schedule for improving water temperature modeling to better meet Clear Creek water temperature objectives. Implement the findings that will result in temperature improvements.

- Consider managing water temperatures further downstream of Igo where the majority of target fish are located.

Percent of Spring Chinook Holding Downstream of Igo



Steelhead Redd Distribution



Adaptively Manage to Habitat Suitability / IFIM Study Results

- **Objective:** Improve flow management through state-of-the-art scientific analysis of habitat suitability.
- **Action**: Continue to operate Whiskeytown Reservoir until habitat suitability studies (*e.g.*, IFIM) are complete.
- **Action**: Propose flows to reduce adverse impacts on spring-run and steelhead Evaluate NMFS
- **Recommendation:** Evaluate NMFS report as it relates to Actions I.1.1. I.1.2. I.1.5. and I.1.6. and implement where appropriate.


Thank You
Any Questions?